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Research and Sponsored Programs Office (RSPO)

Research Naval Postgraduate School (NPS Research Newsletter)

2013

Research at NPS, Vol. 5, No. 5., July/August/September/October 2013

Monterey, California: Naval Postgraduate School

<http://hdl.handle.net/10945/45590>



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VOLUME 5, NO. 5

RESEARCH AT NPS

JULY/AUGUST/SEPTEMBER/OCTOBER 2013

IMPORTANT SPONSORED PROGRAM INFO

Sponsored Program Policy and Guidance Memos	Policy memos on many aspects of sponsored programs can be found at http://www.nps.edu/Research/rspa.html#PolicyGuidance . Subjects include: fiscal responsibilities of PI/PD, proposal routing form, who can be a PI/PD, proposal approval process, categories of sponsored activities, and more.
Proposal Guidelines	Guidelines for preparing proposal can be found at http://intranet.nps.edu/ResAdmin/prop_guide.pdf#general
Proposal Budget Templates	FY13 Proposal Budget Templates and guidelines can be found at http://intranet.nps.edu/ResAdmin/FY13/prop_budg_page.html
Proposal Routing Form	A Proposal Routing Form is required documentation with each proposal. The form is on line at http://intranet.nps.edu/ResAdmin/prop_route_form.html
Use of Human Subjects in Research	Complete guidance on the NPS Human Research Protection Program is on line at http://www.nps.edu/Research/IRB.htm
Export Control	Export control information can be found at http://www.nps.edu/Research/ExportControl/index.html
Research Safety	NPS Research Safety Office information is on line at http://intranet.nps.edu/ResAdmin/Safety/
Annual Training	Principal Investigators/Project Directors are required to complete annual accountability training each fiscal year. Modules are online at: https://www.nps.edu/Technology/WebBasedTraining/Auth/modules/Research/index.asp

INSIDE THIS ISSUE:

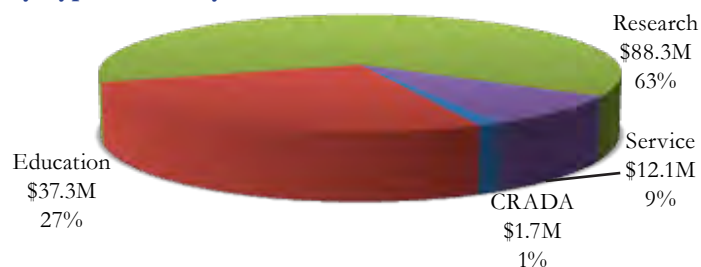
- Sponsored Programs Funding Information
- List of Proposals Funded
- NPS STEM Internship Program Update
- Publications and Faculty News
- NPS/Naval Studies Update
- Technology Transfer/Agreements Awarded
- Patent Awards & Filings
- Technical Reports Published

SPONSORED PROGRAMS STATUS, JUNE 2013 THROUGH SEPTEMBER 2013

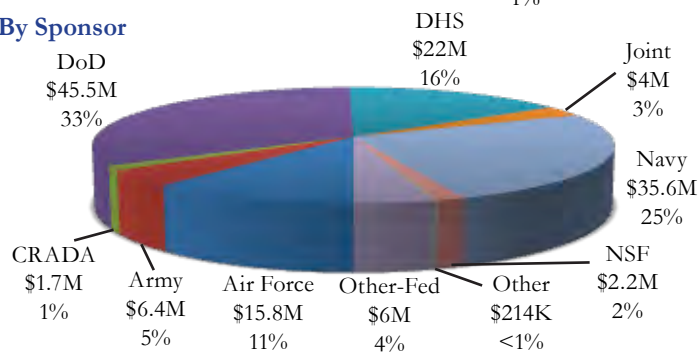
NEW FUNDS AVAILABLE: \$139.4M*

(* No Carryover Funds included)

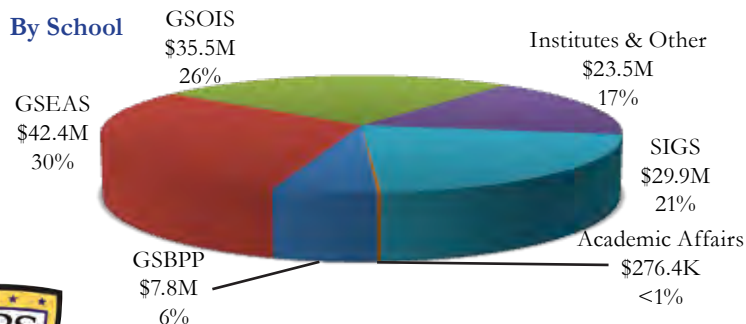
By Type of Activity



By Sponsor



By School

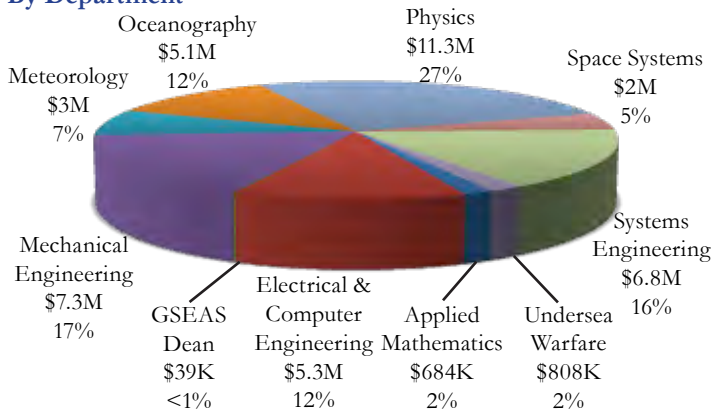


Graduate School of Engineering and Applied Sciences

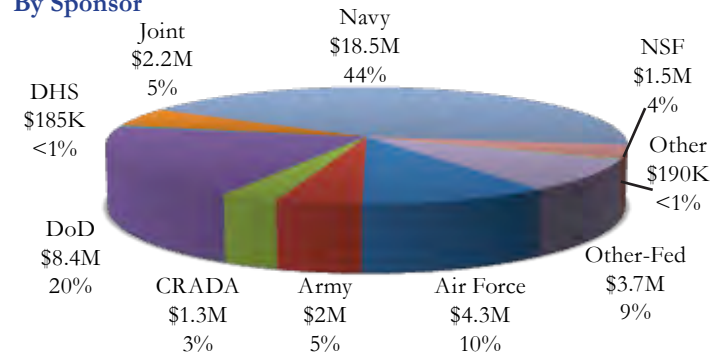
New funds available: \$42.4M*

(* No Carryover Funds included)

By Department



By Sponsor



Projects funded in June through September:

- Military Specific Development and Integration of Commercially Procured Tablets with Existing Department of Defense Data Infrastructures, *LCDR Jeremy Braud*, EC (SPAWAR)
- Concept of Operations Study, *Douglas Fouts*, EC (SAF/FMBIB-AFOY)
- Enhanced Geolocation Capability Against Low Frequency Threat Emitters, *LT Ryan Haag*, EC (SPAWAR)
- Automated Program Analysis for Cyber Security, *John McEachen*, EC (DARPA)
- FY13 Joint Threat Warning System (JTWS) RDT&E, *John McEachen*, EC (USSOCOM)
- Advanced Power Converters for Renewable Energy Interface, *Giovanna Oriti*, EC (ONR)
- Passive Location Processing and Optimal Electronic Attack Routes, *Phillip Pace*, EC (NAVAIR)
- ECE Distance Learning Program, *Clark Robertson*, EC (Various)
- ECE Portion NSA Education Program - Fall 2013, *Clark Robertson*, EC (NSA)
- Component Level Reliability Study of Commercial Inverters for use in PV Systems, *Todd Weatherford*, EC (NAVFAC)
- Tactical Network Load Balancing in Multi-Gateway Distributed Unattended Ground Sensor Systems, *LT Kevin White*, EC (SPAWAR)
- Efficient High-Order Time-Integrators for High-Order Discretization Methods, *Frank Giraldo*, MA (AFOSR)
- Further Development of the Patchy Method of Solving the Partial Difference and Differential Equations of Nonlinear Control, *Arthur Krener*, MA (AFOSR)
- NPS-NRL-Rice-UIUC Collaboration on Navy Atmosphere-Ocean Coupled Models on Many-Core Computer Architectures, *Lucas Wilcox*, MA (ONR)
- Adaptive Optics Center for Excellence for National Security, *Brij Agrawal*, MAE (AFRL)
- Evaluation of Low Pressure Cold Spray Deposition for Repair of Corrosion Damage, *Luke Brewer*, MAE (OSD)
- Processing-Microstructure-Property Relationships for Cold Spray Powder Deposition of Al-Cu Based Aluminum Alloys, *Luke Brewer*, MAE (ONR)
- Specimen Preparation for Transmission Electron Microscopy
- Foils from AA7085 and AA2524 Alloys, *Luke Brewer*, MAE (NAVAIR)
- Gas Generator Modeling and Performance Determination, *Christopher Brophy*, MAE (Strategic Systems Program)
- A Hybrid Approach for Improved Model Characterization of Environmental Parameters for EM Propagation Forecast, *LCRD Robin Cherrett*, MAE (SPAWAR)
- Evaluating the Utility of Robotic Technologies for Joint Human-Robot Missions, *Noel Du Toit*, MAE (DARPA)
- Wind-Turbine Powered Cooling System with Thermal Storage, *Anthony Gannon*, MAE (ONR)
- Herding and Active Force Protection Using Autonomous Agents, *Isaac Kaminer*, MAE (ONR)
- FSI Effects on Dynamic Responses and Failures of Composite Structures Under Fluid Structure Interaction, *Young Kwon*, MAE (ONR)
- Multiscale Pseudospectral Optimal Control for Space Application, *Michael Ross*, MAE (AFOSR)
- Shortest-Time Maneuver Performance for a Class of Satellite Systems, *Michael Ross*, MAE (National University of Singapore)
- Tracking and Data Relay Satellite System Antenna Slew Optimization, *Michael Ross*, MAE (SAF)
- NASA Hurricane and Sever Storm Sentinel (HS3) Observations for Testing Environmental Control, *Patrick Harr*, MR (NASA Goddard Space Flight Center)
- Measurement and Analysis of Phenomenology and Statistics of Sound Propagation Over Sand Dunes on Upper Slope of the Northeastern South China Sea, *Ching-Sang Chiu*, OC (ONR)
- Characterization and Classification of Marine Mammal Vocalizations, *John Joseph*, OC (CNO)
- Finescale Dynamics of the Double-Diffusive Thermocline, *Timour Radko*, OC (NSF)
- Investigations of the Mechanical Properties of a Buried Fiber Optic Sensor for Monitoring and Surveillance, FY2013-2014, *Steven Baker*, PH (USA Engineer R&D Center)
- In-Situ Molecular Diagnostics for Heterogeneous Polymer Composites, *Joseph Hooper*, PH (DTRA)
- MEMS Acoustic Direction Finding Sensor, *Gamani Karunasiri*, PH (National University of Singapore)
- High Altitude Low-Earth Observatory (HALO) Mission Support, *Richard Olsen*, PH (USAF)

SPONSORED PROGRAM STATISTICS

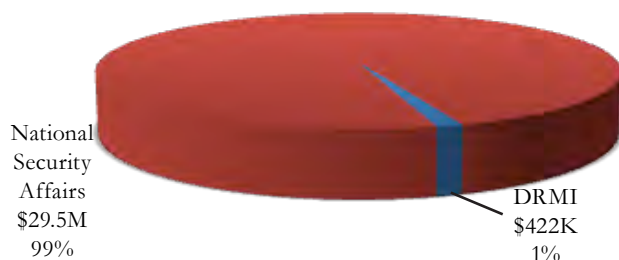
- Observation of Military Systems and Operational Analysis, *Richard Olsen*, PH (OSD)
- Advanced Reactor Concept (ARC) Program, *Craig Smith*, PH (DOE)
- DL Program in Engineering Acoustics, *Kevin Smith*, PH (Various)
- THz Free Electron Laser Diagnostics / Free Electron Laser Simulation, *Conor Pogue*, PH (SPAWAR)
- Maritime *In Situ* Sensing Inter-Operable Networks, Transmission Security 6.2, *Joseph Rice*, PH (ONR)
- Maritime *In Situ* Sensing Inter-Operable Networks, Transmission Security 6.3, *Joseph Rice*, PH (ONR)
- Deep Seaweb Acoustic Communications and Underwater Networking, *Joseph Rice*, PH (SSC-Pacific)
- National Consortium for Measurement and Signature Intelligence (MASINT) Research Support Project, *David Trask*, PH (DIA)
- Multi-Mode Propagation / Laser Accelerator, *Ricardo Vigil*, PH (SPAWAR)
- ABET Laboratory & SE Department Improvement Program, *Dan Burns*, SE (Strategic Systems Program)
- Future ASW Concepts for SWARM Unmanned Systems, *Timothy Chung*, SE (DARPA)
- Enhanced Search and Rescue Effectiveness with UAV SWAR Capabilities, *Timothy Chung*, SE (USCG R&D Center)
- Multidisciplinary Studies Support for U.S. Marine Forces Reserve, *Alejandro Hernandez*, SE (USMC- Marine Forces)
- Simulation Experiments and Efficient Design Center Support to Marine Corp Combat Development Command Operations Analysis Division Austere Basing Study, *Alejandro Hernandez*, SE (USMC - MCCDC)
- Ilities Tradespace and Affordability Program, *Raymond Madachy*, SE (DASD/SE)
- Littoral Warfare Engineering Facility Business Case Analysis, *Raymond Madachy*, SE (NSWC-Port Hueneme Division)
- Demonstration of Exterior Insulation and Finishing Systems at the Department of Navy, *Fernand Marquis*, SE (NAVFAC)
- Improved Wind Resistance Rooftop Photovoltaic Systems, *Fernand Marquis*, SE (ONR)
- High Energy Laser Systems Engineering for Navy Platforms, *Douglas Nelson*, SE (ONR)
- FY14 Master of Science in Systems Engineering Distance Learning Program, *Walter Owen*, SE (Various)
- Masters of Science in Systems Engineering, *Walter Owen*, SE (Various)
- PhD in Systems Engineering DL Program, *Walter Owen*, SE (Various)
- PhD in Systems Engineering, *Walter Owen*, SE (Various)
- SEM PD-21 DL Program, *Walter Owen*, SE (Various)
- Information Volume and Velocity (IV2) Joint Capability Technology Demonstration (JCTD) Independent Assessment, *Clifford Whitcomb*, SE (OSD)
- Mobile CubeSat Command and Control (MC3) Development and Support, *James Newman*, SP (NRO)
- Space Systems Certificate, *Steve Tackett*, SP (VARIOUS)
- Analysis to Develop Total Ownership Cost for the Mark 18 Modification 2 Unmanned Underwater Vehicle (UUV) System, *Clyde Scandrett*, UW (NAVEODTECHDIV)

School of International Graduate Studies

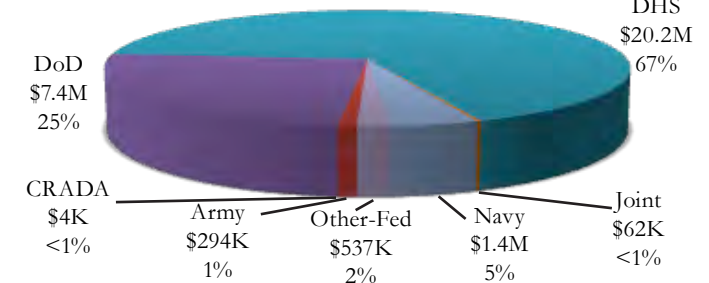
New funds available: \$29.9M*

(* No Carryover Funds included)

By Department



By Sponsor



Projects funded in June through September:

- CCC South Asia Program FY14-18, *Feroz Khan*, NS (DOE)
- CHDS at Naval Postgraduate School Tuition, *Theodore Lewis*, NS (FBI)
- CHDS-NPS FY13 Pacific Area Executive Education (PELP-3), *Theodore Lewis*, NS (DHS/FEMA)
- CHDS-NPS Homeland Defense and Security Leadership Development (FLCP-5), *Theodore Lewis*, NS (DHS)
- Project on Advanced Systems and Concepts for Combating WMD (PASCC), *Clay Moltz*, NS (DTRA)
- Public Service Provision as Peace-Building: How do Autonomous Efforts Compare to Internationally Aided Interventions?, *Jessica Piombo*, NS (ONR)
- Who does not Become a Terrorist and Why? Towards an Empirically Grounded Understanding of Individual Motivation in Terrorism, *Maria Rasmussen*, NS (ONR)
- Military Transformation and the Rise of Brazil, *Harold Trinkunas*, NS (USARO)
- FY14 Regional Security Education Program (RSEP), *Bernard Wang*, NS (U.S. Fleet Forces Command)

NPS HOSTS 98 STEM INTERNS DURING SUMMER 2013

Without a world-class Science, Technology, Engineering and Mathematics (STEM) workforce we will be unable to maintain our technological superiority across our missions and unable to adequately protect our Sailors and Marines at home and abroad. STEM is not just a passing notion to this Department. Rather, it is a mission-critical investment that we have chosen to make in our current and future workforce to ensure that we have the capacity to meet our future challenges.

- Honorable Ray Mabus, Secretary of the Navy

The Naval Postgraduate School (NPS) has a rich history of hosting summer interns to support research and student thesis work. Faculty mentors from a wide array of departments, institutes and academic groups open their labs and introduce interns to cutting-edge research methodologies, and technologies. Simultaneously, research goals are achieved.

From May to August 2013, 98 high school, community college, university and military academy students studying STEM disciplines came to NPS, eager to apply their academic knowledge to hands-on research experiences. Many interns were Monterey County residents, but the prestige of an internship at NPS brought others from London, New York, Denver and the San Francisco bay area. Interns were matched with faculty mentors through various, highly competitive internship programs. In addition to established DoD academy and local partnerships, this was the first year NPS expanded internship offerings to include the Office of Naval Research's



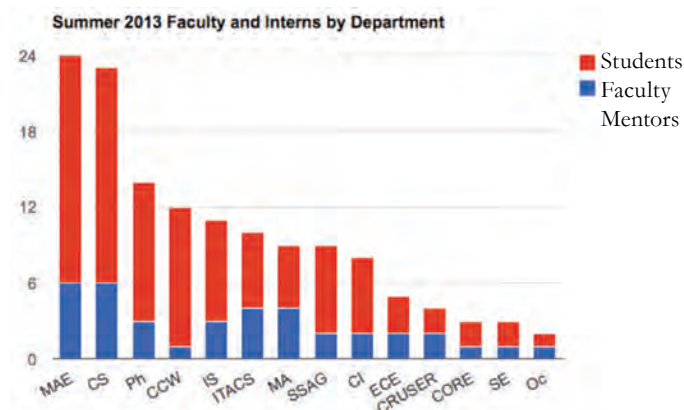
Dylan demonstrating the Crookes Radiometer

Naval Research Enterprise Internship (NREIP) and Science and Engineering Apprenticeship (SEAP) programs.

NPS internships offer a unique opportunity, especially for high school and community college students, to gain exposure to actual research

laboratories. NPS mentors, who possess world-class expertise in their fields, guide interns as they work on relevant and innovative projects such as malware creation and detection, design, modeling and characterization of energy harvesting micro-electro-mechanical devices, and testing unmanned vehicles. Mentors serve as role models and help these young people learn how to navigate working in our unique military academic environment.

Many mentors incorporate interns into their larger teams, consisting of post-docs, graduate students, research associates and lab technicians. This blending of talents has resulted in co-authored



papers with faculty and/or graduate students, intern support for student thesis work, and a broader professional network for the interns. With the help of mentors and team members, each intern leads a tour of their lab for their intern program cohort, to help solidify their learning and work on their presentation skills. The other

NPS INTERNSHIP PROGRAMS

NREIP

The Naval Research Enterprise Internship Program (NREIP) offers opportunities for undergraduate and graduate students to align their academic interests with research being done at DoN labs. Participating students spend 10 weeks participating in research, and furthering their education via mentoring.

SEAP

The Science and Engineering Apprenticeship Program (SEAP) encourages academically talented high school students with interest and ability in science and mathematics to pursue science and engineering careers while furthering their education via mentoring at DoN labs.

COMMUNITY COLLEGE CATALYST (3C)

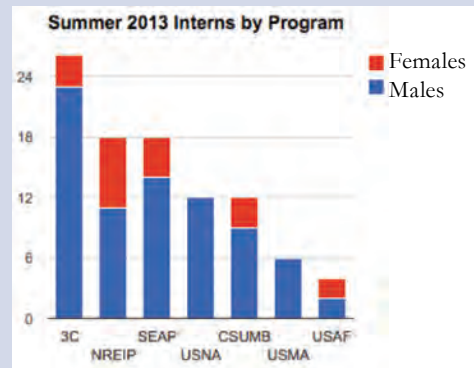
Working with the award winning NASA-CIPA and NSF-sponsored programs at Hartnell Community College, NPS matches undergraduate students who excel in STEM disciplines with NPS research faculty for 8 weeks each summer. NPS has hosted more than 100 internships over the past 7 years.

CSUMB – UROC

The Undergraduate Research Opportunities Center (UROC) at California State University, Monterey Bay trains, supports, and engages students in undergraduate research. UROC students work on relevant and innovative research projects at regional research institutions.

SERVICE ACADEMIES

NPS supports our military partners and hosts U.S. Naval Academy Midshipmen, U.S. Air Force Academy Cadets and U.S. Military Academy at West Point Cadets.



interns begin to understand the breadth of research being done at NPS. Interns also produce a research poster or quad chart, chronicling the progression of their work during the summer.

Professional development, and team-building activities are also offered outside of the lab. This past summer, NPS Interim President RDML Jan Tighe and Dean of Research Jeff Paduan addressed the interns during a lunchtime conversation, sharing their own STEM academic and professional journeys. Other activities included an overview of NPS award-winning library facilities, student representatives describing their Scholarship for Service (SFS) MONARCH experiences, a digital scavenger hunt to become familiar with the history and grounds of NPS, and lunchtime brown bag meetings. There was also a special tour of the America's Cup Oracle headquarters to meet the engineers and technicians who created the winning catamaran.

Everyone involved with these internships achieves positive goals. After a summer of one on one mentoring, research work and internship activities, students leave NPS excited about STEM. They have begun to develop a professional support network and have a better understanding of Naval research and opportunities that may be open to them in the future. As they head back to school, it is not uncommon to hear interns say "I can now see myself as an engineer." NPS and DoN gain valuable access to young STEM talent that we hope will chose to be a part of the future Naval workforce, contributing their talents to uncover the next set of the nation's innovative discoveries.

SUCCESS

Exploring naval research at NPS has already opened up avenues and created positive outcomes for some of this summer's interns:

- Blake Guidice, a SEAP intern in the Space Systems Academic Group is applying to the US Naval Academy because of his time here. He was been asked to contribute his story for the upcoming Naval STEM Newsletter: Fall Edition.
- Michael Zhu, a SEAP student is writing a joint paper with one of Dr. Wang Kei's graduate student.
- Wes White, a 3C intern was just accepted into the SFS MONARCH Winter 2014 cohort.
- Lauren Polo, a 3C intern won the Aerospace Engineering Division for Undergraduate Poster Presentation at the annual Society for Advancement of Chicanos and Native Americans in STEM Fields (SACNAS) national conference recently held in Texas. Her poster highlighted the high altitude balloon research she did while working with the SSAG. She and several other 3C interns are continuing their internships during the school year.



NREIP, SEAP, 3C and CSUMB interns made up the SSAG High Altitude Balloon (HAB) team this summer. Mentors were Dr. James Newman, a former astronaut, and Dr. Rudy Panbolzer.

All programs are now open for student and faculty applications for summer 2014. Visit nps.edu/stem for more details.

PARTICIPATING PROJECTS INCLUDED:

1. Advanced Robotic Systems Engineering Laboratory (AR-SEN)
2. Aerospace Small Satellite Design Program
3. Analysis of file summary data with digital forensics
4. Center for Survivability and Lethality (CSL) Simulation and Flight Test of Unmanned Aerial Vehicle Helicopters
5. Cyber Adventurer Team
6. Design, modeling and characterization of energy harvesting MEMS devices
7. Developing Privacy Protocols for Cyberphysical Infrastructure Networks: The SmartGrid
8. Electronics, Software, & Mechanical Engineering Lab Environment
9. Free Syrian Army social media analysis
10. Fundamental Combustion of Biofuels and Application to Navy Diesel Engines
11. Hands-on research in Small Satellite Lab
12. High strain-rate response of mechanophoric polymer composites
13. HTML5 Databases on Smart Devices Exploration
14. Information Exchange Modeling
15. Malware Development and Detection
16. Measuring Light Emission From Semiconductors
17. Modeling high-velocity impact on armor materials
18. Multi-modal Biometric Authentication for Mobile Devices
19. Non-hydrostatic Unified Model of the Atmosphere and Ocean Development
20. Novel metal oxide aerogel / graphitic hybrids for super capacitive energy storage
21. Physics of materials in extreme conditions
22. Potential business uses for WebCenter portal via Oracle's Jdeveloper
23. RC vehicle and navigation system integration
24. Robot Lab Experiments Development and Testing
25. Segmented Mirror Telescope Control Computer programming
26. Software application development for data collection, analysis and sense-making
27. The Crookes Radiometer
28. Unmanned Aerial Vehicle Helicopters Simulation and Flight Testing
29. Virtualization and Cloud Computing
30. Web Applications Development (Forms, Batch File)
31. Web based document storage and retrieval, Big Data Project Involving Databases and Java Programming
32. Web Design (Wiki) Software Library Development

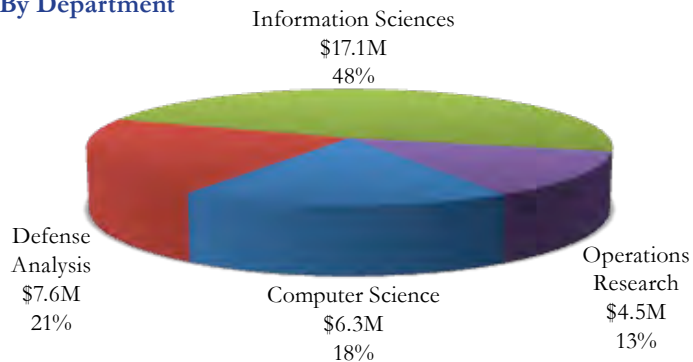
SPONSORED PROGRAM STATISTICS

Graduate School of Operational and Information Sciences

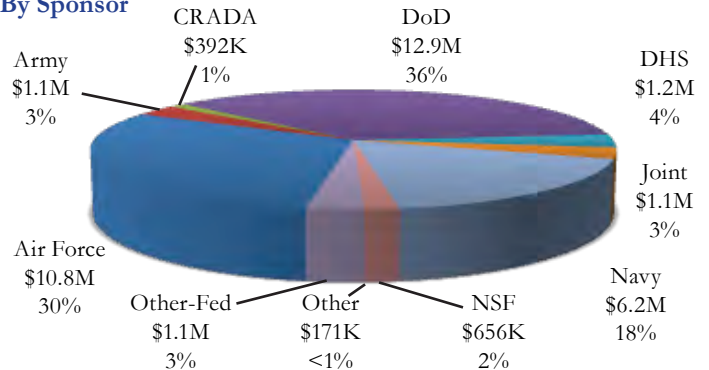
New funds available: \$35.5M*

(* No Carryover Funds included)

By Department



By Sponsor



Projects funded in June through September:

- Navy Certifier Program Special Offering, *Karen Burke*, CS (Military Sealift Command, NAWC-Aircraft Division, NUWC-Keyport Division)
- Navy Certifier Program Special Offering, *Karen Burke*, CS (SSC-Atlantic)
- NSA Centers of Excellence Support, *George Dinolt*, CS (NSA)
- Runtime Verification of Complex Probabilistic Agent-Based Systems, *Doron Drusinsky*, CS (DTRA)
- DARPA Cyber Grand Challenge Test and Evaluation Framework, *Christopher Eagle*, CS (DARPA)
- Software Engineering Distance Learning PhD Education Program, *Loren Peitso*, CS (Various)
- Collaborative Research: Developing a Normative Framework for Cyber Warfare, *Neil Rowe*, CS (NSF)
- Detecting Threatening Insiders with Lightweight Media Forensics, *Simson Garfinkel*, CS (DHS)
- Adapt Unattended Ground Sensor Development and Integration, *Gurminder Singh*, CS (DARPA)
- Assessing War in History, Theory and Policy, *Leo Blanken*, DA (OSD)
- Special Operations Technology Discovery, *Nancy Budden*, DA (OSD)
- Client Requirements Document for Core Lab Advanced Analytics - Joint Task Force North, *Sean Everton*, DA (NELO)
- Combating Terrorism Fellowship Program Instructional Program, *Sean Everton*, DA (Combating Terrorism Fellowship Program)
- CORE Lab Level 1 Social Network Analysis (SNA) Distance Learning Seminar, *Sean Everton*, DA (USA Deputy Chief of Staff G-8)
- Counter Terrorism Fellowship Program International Student Data Repository, *Sean Everton*, DA (Counter Terrorism Fellowship Program)
- Dynamic Tweet Network Analysis (DTNA), *Sean Everton*, DA (CTTSO)
- Dynamic Tweet Network Analysis (DTNA) Research Support to USSOCOM, *Sean Everton*, DA (USSOCOM)
- Syria Case Study: Social Media Exploitation Methodology for Illuminating Dark Networks, *Sean Everton*, DA (OSD)
- Global Education and Collaboration Community Online (Global ECCO) Website and Related Projects for CTFP Alumni, *Michael Freeman*, DA (Counter Terrorism Fellowship Program)
- Academic Curriculum Support, *Brian Greenshields*, DA (USSO-COM)
- 21st Century Command: Challenges Ahead, *Anna Simons*, DA (OSD/NA)
- Naval Tactical Cloud, *Dan Boger*, IS (SPAWAR)
- Long Range Wireless Network: Boarding Team to Cutter, *Alex Bordetsky*, IS (USCG R&D Center)
- Automatic Boat Registration, *James Ehlert*, IS (USCG R&D Center)
- Expeditionary Tablets Field Demonstration, *James Ehlert*, IS (NAVSEA)
- Rapid Open Geospatial User-Driven Enterprise (ROGUE) Joint Capability Technology Demonstration (JCTD) Interim-Operational Test Agency (OTA), *Shelley Gallup*, IS (USSOUTH-COM)
- Space and Missile Defense Command (SMDC) Nanosatellite Project-3 (SNAP-3) Joint Capability Technology Demonstration (JCTD) Operational Test Agency, *Shelley Gallup*, IS (US-SOUTHCOM)
- Counter Transnational Organized Crime Agile, Asymmetric Acquisition Of Enterprise Information Systems (A3EIS), *Christopher Gunderson*, IS (ODASD)
- Multi-Agency Collaboration Environment (MACE) Technical Director, *Christopher Gunderson*, IS (OUSD(I))
- Thermal Imaging Optical Radar Suitability Program, *Alan Jaeger*, IS (NSWC-Port Hueneme Division)
- Undiscovered Secrets: Leveraging Lexical Link Analysis (LLA) to Discover New Knowledge Using Open Social Media Data Sources, *Douglas MacKinnon*, IS (DIA)
- Networking in Permissive and Contested Environments, *William Roeting*, IS (USAF)
- AC Working Group, *William Roeting*, IS (AFLCMC)
- Next-Generation Network Science, *David Alderson*, OR (ONR)
- Seminar on Trans-Atlantic Civil Security Course Development, *Andrew Bellenkes*, OR (George C. Marshall Center)
- Large-Scale Optimization, *Gerald Brown*, OR (AFOSR)
- Planning Environmental Cleanup at Closed Army Installations, *Robert Dell*, OR (OA-22 HQ, ACSIM)

SPONSORED PROGRAM STATISTICS

- Applications for the Biosense Monitoring Tool, *Ned Dimitrov*, OR (UT, Austin)
- OSD Campaign Analysis, *Paul Ewing*, OR (OSD)
- JITC Phase II Design of Experiments Training, FY2013, *Robert Koyak*, OR (JITC)
- Statistical Research to Support Aegis SPY-1 Operations, *Robert Koyak*, OR (PEO IWS)
- Analytical Support for AEGIS Combat Systems, *CAPT Deidre McLay*, OR (PEO IWS)
- Masters in Cost Estimating and Analysis, *Gregory Mislick*, OR (Various)
- Masters of Systems Analysis (MSA) Program, *Steven Pilnick*, OR (Various)
- Optimization of Complex Systems in the Presence of Uncertainty and Approximation, *Johannes Royset*, OR (AFOSR)
- Inventory Optimization for NAVSUP Enterprise Resource Planning, *Javier Salmeron*, OR (NAVSUP)
- Certificate in Human System Integration, *Lawrence Shattuck*, OR (Various)
- Human Systems Integration DL Program, *Lawrence Shattuck*, OR (Various)

Graduate School of Business and Public Policy

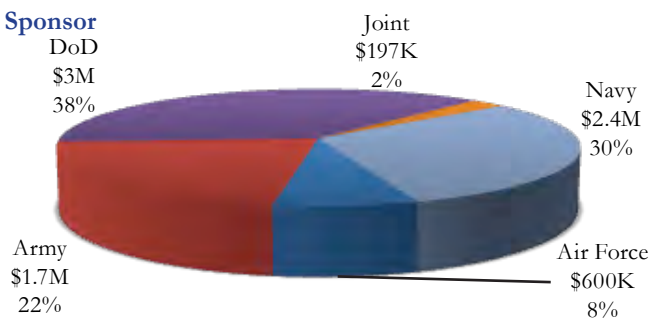
New funds available: \$7.8M*

(* No Carryover Funds included)

Projects funded in June through September:

- Advanced Acquisition Program: Phase 1 Only (AAP 56-41), *John Dillard*, GSBPP (USAMRMC)
- Support to the Naval Sea Logistics Center, *Kenneth Euske*, GSBPP (Naval Sea Logistics Center)
- Beyond Military Decision Making (MDMP): 351st Civil Affairs Command Korea Planning, *Karen Guttieri*, GSBPP (US-ACAPOC)
- Civilian EMBA DL Program, *William Hatch*, GSBPP (Various)
- Civilian Executive MBA Program, *William Hatch*, GSBPP (Various)
- Civilian Executive MBA Program 807 Cohort Model, *William Hatch*, GSBPP (OASN)
- Multi-Modal Information Sharing Team (MIST) Research Supporting Homeland Security Information Network Critical Sectors Air Domain Awareness, *Susan Hocerar*, GSBPP (ONI)
- Secretary of the Navy Office of Small Business Programs Sponsored Research, *Max Kidalov*, GSBPP (SECNAV)
- Organizational Resilience: Further Development of a Measure, *Edward Powley*, GSBPP (CNO)
- Support for Energy Systems Technology Evaluation Program (ESTEP), *Eva Regnier*, GSBPP (ONR)
- Evaluation of Comprehensive Soldier and Family Fitness Program Phase II, *Yu-Chu Shen*, GSBPP (Army Deputy Chief of Staff, G3/5/7)

By Sponsor



- Army: FY13 Sponsored Acquisition Research & Grants, *Keith Snider*, GSBPP (ASC Army)
- Deputy Director, Acquisition Career Management - Army Student Research Support, *Keith Snider*, GSBPP (ASC Army)
- Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, *Keith Snider*, GSBPP (OUSD (AT&L))
- Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics: Research Studies, *Keith Snider*, GSBPP (USD(AT&L)/ARA)
- Support for Energy Systems Technology Evaluation Program, *Keith Snider*, GSBPP (ONR)

FACULTY NEWS & NPS RELATED PUBLICATIONS

APPLIED MATHEMATICS

Kilic, E., & Stanica, P. (2013). General approach in computing sums of products of binary sequences. *Hacetatepe Journal of Mathematics and Statistics*, 42(1), 1-7.

Jangveladze, T., Kiguradze, Z., Neta, B., & Reich, S. (2013). Finite element approximations of a nonlinear diffusion model with memory. *Numerical Algorithms*, 64(1), 127-155.

Luo, F., Lu, R., Zhou, H., Hu, F., Bao, G., Huang, B., et al. (2013). Metabolic effect of an exogenous gene on transgenic beauveria bassiana using liquid chromatography-mass spectrometry-based metabolomics. *Journal of Agricultural and Food Chemistry*, 61(28), 7008-7017.

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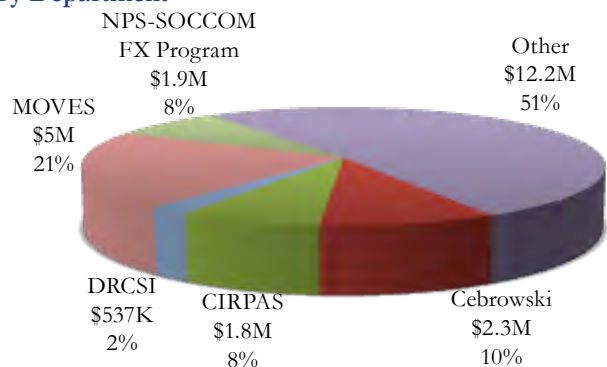
SPONSORED PROGRAM STATISTICS

Research and Education Institutes, Centers, and Other

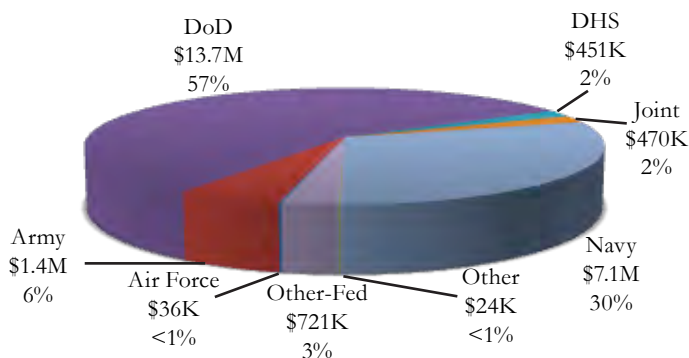
New funds available: \$23.8M*

(* No Carryover Funds included)

By Department



By Sponsor



Projects funded in June through September:

- Cyber Security - Portugal, *Alan Howard*, USPTC (NETSAFA)
- Cyber Security Operations - Romania, *Alan Howard*, USPTC (NETSAFA)
- Protection of Civilians Course, *Alan Howard*, USPTC (NETSAFA)
- Joint Interagency Field Exploration (JIFX) Project: Enhanced Homeland Security Focus, HSHQPM-13-X-00128, *Raymond Buettner*, RSPO (DHS)
- Coastal Research Conference Travel, *Jeffrey Paduan*, RSPO (Gordon Research Conferences)
- NDEP Support for NPS NSSEFF Program - FY13/14, *Jeffrey Paduan*, RSPO (OSD)
- Surface Current Mapping Network Based on High Frequency Radars for the Integrated Ocean Observing System Central/Northern California Ocean Observing System, *Jeffrey Paduan*, RSPO (NOAA)
- Energy Efficient Outpost Modeling Consortium, *Sue Higgins*, Cebrowski (ONR)
- Naval Postgraduate School Support for Navy Energy Coordination Office, *Sue Higgins*, Cebrowski (OPNAV)
- Strategic Planning Guidance Transition Plan - Naval Postgraduate School Analysis, *Scot Miller*, Cebrowski (OASN)
- Cold Formed Steel Follow-On Study, *Brian Steckler*, Cebrowski (COMNECC)
- Naval Postgraduate School Hastily Formed Networks Group Support to the Office of Naval Research and the MARFOR-PAC Experimentation Center, *Brian Steckler*, Cebrowski (ONR)
- COMBATXXI Behavior Development and Technical Support, *Imre Balogh*, MOVES (USMC - MCCDC)
- Virtual Battlespace Scenario Encoding for Reuse, *Curtis Blais*, MOVES (NSWC-Dahlgren Division)
- Anti-Submarine Warfare Community of Interest Interoperability, *Don Brutzman*, MOVES (PEO IWS)
- MMOWGLI Fixed-Cost Game Deployment Support and Community Launch, *Donald Brutzman*, MOVES (ONR)
- Early Synthetic Prototyping, *Rudolph Darken*, MOVES (USA Engineer R&D Center)
- Data Visualization Tool (DAVITO) Enhancements Supporting the Southern Philippine Public Perception Survey (SPPPS) Exploration and Analysis Project, *Rudolph Darken*, MOVES (TRAC - Monterey)
- Developing a Field - Deployable Video Acquisition Capability for Commander, Naval Air Forces Atlantic (CNAL), *Gurminder Singh*, MOVES (ONR)
- Advanced Distributed Learning Initiative, *Joseph Sullivan*, MOVES (DHRA)
- Healthcare Modeling & Simulation Certificate Course - Veteran's Health Administration, *Joseph Sullivan*, MOVES (Department of Veteran's Affairs)
- Joint Integrated Innovation Environments (JIIE) Project, *Raymond Buettner*, NPS-SOCCOM (OSD)
- Technical Support and Operational Analysis and Related Field Experimentation Phase 1, *Raymond Buettner*, NPS-SOCCOM (USARO)
- 13th Marine Expeditionary Unit Certification, *Robert Bluth*, CIRCAS (USMC MEF)
- Black Dart Sentry Support, *Robert Bluth*, CIRCAS (JIAMDO)
- TSOA 13-4 and Related Field Experimentation, *Robert Bluth*, CIRCAS (ARI)
- NPS/CIRCAS Support of ONR Airborne Research Objectives, *Haflidi Jonsson*, CIRCAS (ONR)

FACULTY NEWS & NPS RELATED PUBLICATIONS

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CENTER FOR INTERDISCIPLINARY REMOTELY-PILOTED AIRCRAFT STUDIES (CIRPAS)

Hersey, S. P., Craven, J. S., Metcalf, A. R., Lin, J., Lathem, T., Suski, K. J., Cahill, J. F., Duong, H. T., Sorooshian, A., **Jonsson, H. H.**, et. al. (2013). Composition and hygroscopicity of the Los Angeles Aerosol: CalNex. *Journal of Geophysical Research-Atmospheres*, 118(7), 3016-3036.

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DEFENSE RESOURCES MANAGEMENT

INSTITUTE

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ELECTRICAL & COMPUTER ENGINEERING

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On May 25, 2013, Distinguished Professor **Jon T. Butler** received the Outstanding Paper Award for S. Nagayama, T. Sasao, and **J. T. Butler**, "Analysis of multi-state systems with multi-state components using EVMDs", *Proceedings of the 42nd International Symposium on Multiple-Valued Logic*, Victoria, Canada, May 14-16, 2012, pp. 122-127.

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INFORMATION SCIENCES

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Mechanical and Aerospace Professor and Chairman, **Knox T. Millsaps**, has been appointed as an Associate Editor of the Transactions of the ASME, Journal of Turbomachinery. Professor Millsaps is an expert in Gas Turbines and Power & Propulsion.

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Terwey, W., Abarca, S. F., & Montgomery, M. T. (2013). Corrigendum. *Journal of the Atmospheric Sciences*, 70(7), 2335-2335.

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MODELING, VIRTUAL ENVIRONMENTS AND SIMULATION INSTITUTE (MOVES)

Two MOVES faculty members, Dr. **M. Kolsch** and Dr. **A. Sadagic** presented two papers at the 15th International Conference on Human-Computer Interaction <http://www.hcii2013.org/>, held between 21 and 26 July, 2013, in Las Vegas:

Mathias Kölsch, Juan Wachs, and **Amela Sadagic** (2013). Visual Analysis and Filtering to Augment Cognition, *The HCI International*, July 2013

Amela Sadagic (2013). Next Generation of Physical Training Environments: Bringing in Sensor Systems and Virtual Reality Technologies, *The HCI International*, July 2013

Dr. **Sadagic** also served as a Session Chair for session: "Augmenting Human Capabilities on Training Ranges: Towards the Smart Instrumented Training Ranges of the Future"

Sadagic, A., Kölsch, M., Welch, G., Basu, C., **Darken, C.,** Wachs, J.P., Fuchs, H., Towles, H., **Rowe, N.,** Frahm, J.-M., Guan, L., Kumar, R., Cheng, H. (2013). Smart instrumented training ranges: bringing automated system solutions to support critical domain needs, *The Journal of Defense Modeling and Simulation*, Volume 10, Issue 3, July 2013. This paper can be viewed on the web at: <http://dms.sagepub.com/content/10/3/327>

NATIONAL SECURITY AFFAIRS

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OCEANOGRAPHY

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Chiu, L. Y. S., & **Reeder, D. B.** (2013). Acoustic mode coupling due to subaqueous sand dunes in the south china sea. *Journal of the Acoustical Society of America*, 134(2), EL198-EL204.

DeRuiter, S. L., Southall, B. L., Calambokidis, J., Zimmer, W. M. X., Sadykova, D., Falcone, E. A., Freidlaender, A. S., **Joseph, J. E.,** et al. (2013). First direct measurements of behavioural responses by cuvier's beaked whales to mid-frequency active sonar. *Biology Letters*, 9(4), 20130223.

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Stanton, T. P., Shaw, W. J., Truffer, M., Corr, H. F. J., Peters, L. E., Riverman, K. L., et al. (2013). Channelized ice melting in the ocean boundary layer beneath pine island glacier, antarctica. *Science*, 341(6151), 1236-1239.

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OPERATIONS RESEARCH

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TECHNOLOGY TRANSFER/AGREEMENTS

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA)

Title: Cold Spray Deposition of Thermoelectric Material for Waste Heat Recovery

Partner: Northern Lights Applied Science

PI: Sebastian Osswald, Physics

Summary: The goal of this effort is to develop and test cost effective processes and systems designs for the recycling of waste thermal energy into available electrical power that can then be applied to support the military's mission. The effort performed under this agreement has the potential to benefit the Navy and other military services by contributing to reducing overall military fuel costs, environmental impact and military casualties associated with fuel transport operations.

LIMITED PURPOSE COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT (LPCRADA)

Title: Equipment Loan

Partner: L-3 Communications Integrated Systems, Limited Partnership, Mission Integration Division (L-3)

PI: Phillip Pace, Electrical and Computer Engineering

Summary: Equipment will be used solely for testing and evaluating in the classroom laboratory setting for the capability to digitize a wideband radio frequency (RF) spectrum, including optimal configuration of the RF sample rates and modulation patterns, machine learning to process detected signals across this wide bandwidth, wideband single channel multi-octave direction finding, optimal detection algorithms and how to handle signals folded on top of each other to better understand issues involved in ultra wideband Electronic Warfare (EW).

Title: Equipment Loan

Partner: NTT IT Corporation

PI: Gurminder Singh, Computer Science

Summary: The Multi-media communication systems will be used solely for testing and evaluating video ingest workflows for aircraft carrier-based media acquisition and dissemination. The equipment will be used to transcode and retransmit compressed signals, as well as serve as an archive of the uncompressed signals for further down-stream processing and data replication services.

Title: Equipment Loan

Partner: TrustComm, Inc.

PI: Brian Steckler, Information Sciences

Summary: Equipment will be used solely for field testing within the NPS Hastily Formed Network project. Researchers will conduct stress tests and throughput measurements of broadband satellite Internet access devices and evaluation of a quick deploy satellite phone sleeve voice capabilities in an austere environment.

MEMORANDUM OF AGREEMENT (MOA)

Title: Joint Education and Research Programs

Partner: Naval Air Systems Command

PI: Walter Owen, Systems Engineering

Summary: This agreement is intended to promote the spirit of collaboration between the Naval Air Systems Command (NAVAIR) and the Naval Postgraduate School (NPS). Specifically, this MOA is established to promote joint education programs, research and professional projects for each participant's mutual advantage and to forge a cooperative relationship to further the educational, research and service missions of each party. This agreement identifies the roles and responsibilities of the parties involved.

Please submit your faculty and research news (published articles, conference proceedings, conference presentations, books, honors received, accomplishments, milestones, etc.) to research@nps.edu.

Title: Memorandum of Agreement between the Naval Postgraduate School and National Aeronautics and Space Administration

Partner: The National Aeronautics and Space Administration

PI: Richard Olsen, Physics

Summary: The purpose of this agreement is to outline the responsibilities regarding the utilization of the NASA-operated WB-57 aircraft based at the Johnson Space Center in support of the NPS Remote Sensing Center (RSC)-Sponsored High Altitude Low-earth Observatory (HALO) Missions. A critical need exists for medium-to high-altitude airborne platforms to support RSC and mission partner requirements. RSC requires use of the WB-57 to support requirements which include, but are not limited to, research development, test, evaluation, and demonstration of projects of high-altitude advanced sensors and technology.

Title: Memorandum of Agreement between the Naval Postgraduate School and the Office of Naval Research Global: Dr. Ramesh Kolar Temporary Assignment

Partner: Office of Naval Research Global

PI: Clifford Whitcomb, Systems Engineering

Summary: The purpose of this agreement is to outline the responsibilities of Dr. Ramesh Kolar's detail to the Office of Naval Research Global (ONRG). The overall strategic goal for Naval Postgraduate School (NPS) is to extend the reach of its educational programs to its global partners through collaboration and research. He will serve as an Associate Director for Global Technical Awareness and a regional expert who interfaces with researchers in India. Working from the ONRG office located in the US Embassy in Singapore, Dr. Kolar will apply his education, training and technical experience to develop international programs which identify emerging scientific research to address current and future naval Needs. Dr. Kolar will also work with other Associate Directors to establish a coordinated multi-disciplinary approach to advance Naval S&T in support of the Naval Research Enterprise (NRE).

NPS/NAVAL STUDIES PROGRAM UPDATE

The new Navy-funded faculty research program known as the NPS/Naval Studies Program (NSP) kicks off this fall. The Program represents a terrific opportunity for NPS faculty (and students) to work directly with OPNAV staff members in the Pentagon on operational problems. As the many projects funded here come to fruition, NPS should reap the dual benefits of letting NPS faculty know more about the Navy's most pressing problems and letting Navy leadership know more about NPS research capabilities.

After a somewhat rocky process over the summer to match up Naval requirements with NPS faculty capabilities, 51 Navy and 26 USMC projects were approved to move forward. Funding arrived at NPS in October and individual projects should have their funding in November. The table below outlines how the funding has been allocated so far for FY14, including a significant hold-back for possible sequestration-related cuts. Should those cuts not be necessary, an additional 16 Navy projects are in line for possible mid-year starts and the ongoing USMC projects will receive additional funding.

Work is underway to develop a smoother and more effective process for identifying the FY15 research topics. The key to that

process will be the Research Requirements Fair planned for March 2014 and designed to solicit topics from the various OPNAV codes and introduce NPS faculty to the OPNAV representatives. The goal for the FY15 process is to have all of the projects approved by July 2014 to better fit within the annual faculty planning cycle.

NPS/Naval Studies Program Allocations for FY14	\$M
Initial program allocation to NPS	14.00
Sequestration hold back/cut	2.00
Small Business Innovative Research (SBIR) tax on all RDT&E Funds	0.85
(51) Approved Navy Projects	7.83
(26) Approved Marine Corps Projects	1.75
NPS Overhead*	1.67

15% of received funds (10% for campus-wide support and 5% for NSP office)

NPS RESEARCH INFORMATION:

- The quarterly *Compilation of Thesis Abstracts* is available at: <http://www.nps.edu/research/MoreThesisAbst.html>
- Past editions of "Research News" are available at: <http://www.nps.edu/research/Newsletters.html>
- The *Annual Summary of Faculty Research* is available at: <http://www.nps.edu/research/SummaryRes.html>
- The Faculty Expertise Directory is available at: <http://faculty.nps.edu/vitae/cgi-bin/vita.cgi>

PATENT APPLICATIONS, AWARDS AND FILINGS

Patent Award issued, entitled, “Miniature Micro-electromechanical System (MEMS) Based Directional Sound Sensor” Patent No.: US 8,467,548 B2

Inventors: Professor Gamani Karunasiri and Dr. Jose Sinibaldi

Patent Award issued, entitled, “Hybrid Soft Decision Hard Decision Reed Solomon Decoding” Patent No.: US 8,473,826 B1

Inventor: Capt. James Caldwell

Patent Award issued, entitled “Automatically Guided Parafoil Directed to Land on a Moving Target” Patent No.: US 8,483,891 B2

Inventors: Professor Oleg Yakimenko, Research Associate Eugene Bourakov, and Charles Hewgley

Patent Award issued, entitled “Automatic Parafoil Turn Calculations Method and Apparatus” Patent No.: US 8,489,256 B2

Inventors: Professor Oleg Yakimenko

Patent Award issued, entitled, “Bimaterial Microelectromechanical System (MEMS) Solar Power Generator” Patent No.: US 8,525,393 B1

Inventors: Assistant Professor Dragoslav Grbovic and Assistant Professor Sebastian Osswald

Patent Award issued, entitled, “Near Losses Data Compression Method Using Nonuniform Sampling” Patent No.: US 8,526,746 B1

Inventors: Professor Leonard Ferrari and Pathamandai Sankar

Patent Filing, entitled, “Method and Apparatus for Determining

Spacecraft Maneuvers” Navy Case No.: 20120007

Inventors: Professor Isaac M. Ross and **Research Assistant Professor Mark Karpenko**

Patent Filing, entitled, “Method for Determining Shortest Oceanic Routes” Navy Case No.: 20130008

Inventors: Distinguished Professor Gerald Brown and **Distinguished Professor Emeritus Alan Washburn**

Patent filing, entitled, “Method for Additive Manufacturing Using Ph and Potential Controlled Powder Solidification” Navy Case No.: 20130001

Inventors: Assistant Professor Sebastian Osswald, Associate Professor Luke Brewer and Andrew Johannes

Patent filing, entitled, “Terahertz (THz) Reserve Micromagnetron” Navy Case No.: 20100010C

Inventors: Associate Professor Andres Larraza, Jeffrey Catterlin and David Wolfe

Patent filing, entitled, “Micro-coupling Active Release Mechanism” Navy Case No.: 2009003D1

Inventors: Associate Professor Marcello Romano, Professor James Newman and William Crane

TECHNICAL REPORTS PUBLISHED

NPS-CS-13-003	Passive TCP Reconstruction and Forensic Analysis with tcpflow	S. Garfinkel, M. Shick
NPS-CS-13-004	State Estimation of Non-monotonic, Partially Non-deterministic Software with Sparse Probing using an Unscented Kalman Filter combined with Logic Reasoning	D. Drusinsky
NPS-CS-13-006	Bulk Extractor 1.4 User's Manual	J. Bradley, S. Garfinkel
NPS-CS-13-007	Bulk Extractor 1.4 Programmers Manual for Developing Scanner Plugs-Ins	J. Bradley, S. Garfinkel
NPS-FX-13-001	NPS Field Experimentation Program for Special Operations (FEPSO) TNT 13-1 Report	R.R. Buettner Jr., C. Oros, R. Meyer, M. Jones, N. Turley
NPS-FX-13-002	NPS Field Experimentation Program for Special Operations (FEPSO) TNT 13-2 Report	R.R. Buettner Jr., C. Oros, R. Meyer, N. Turley
NPS-GSBPP-13-003	Increasing the Department of the Navy's Opportunities for Small Business and Non-Traditional Suppliers through Simplified Acquisitions Contracting and NAICS Targeting	M. Kidalov, J. Lee
NPS-MAE-13-002	Effects of Fluid-Structure Interaction on Dynamic Response of Composite Structures: Experimental and Numerical Studies	Y. Kwon
NPS-OR-13-004	Optimizing the Army's Aerial Reconnaissance and Surveillance Asset Mix via the Joint Platform Allocation Tool (JPAT)	E. Craparo, K. Smead, J. Tabacca

Technical reports may be obtained at <http://www.nps.edu/Research/TechReports.html>

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